

Gaining Social Consensus for Road Pricing through a Policy Mix Approach*

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1. Introduction

Environmental problems due to road congestion are becoming increasingly severe in big cities around the world, especially in Japan, and a solution is badly needed. Road pricing in Tokyo is now being investigated in anticipation of its introduction in 2003. This paper examines the problems of achieving a social consensus toward road pricing, which is a major hurdle to be overcome in its introduction. I will suggest that this consensus is best gained through a policy mix approach as opposed to a package approach.

In environmental policy, there are typically a variety of aims to be met, and a variety of measures to achieve those aims. It is becoming important in environmental policy design to explain not only the aims of a policy, as was done in the past, but also the measures being applied to achieve them. In the case of road pricing, which imposes an economic burden, it is important that policies are both well designed, and are fully disclosed to the public in order to gain social consensus. This paper will examine a number of policy mixes that can be used to gain social consensus for road pricing, and explain the effects and problems of each.

2. Environmental Pollution and Recent Changes in Social Consciousness Concerning Road Pricing

In recent years, physical pollution due to road congestion has become more severe as traffic volumes have increased in urban centers. This is especially true in big cities in Japan. Most notably, the density of both nitrogen oxides (NO_x) and suspended particulate matter (SPM) has become problematic. The density of NO_x and SPM has rarely decreased during the last 30 years, and has actually begun to rise, in spite of government efforts to reduce it.

As traffic-related pollution has increased, so too has public concern for the problem. In an out-of-court settlement reached in December 2000, a group of residents in Amagasaki filed suit against the State and the Hanshin Expressway Public Corporation. Two main

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terms were agreed upon in the settlement (For detail, refer to the *Asahi Shimbun* and the *Nihon Keizai Shimbun*). First, the State and the Hanshin Expressway Public Corp. will enforce road pricing on the Kobe route and Wangan route of the Hanshin Expressway earlier than previously scheduled. Second, the residents will withdraw their claim for financial compensation for damages to their health. This suit is remarkable for the fact that a group of private citizens were successful in convincing the State and the Hanshin Expressway Public Corp. to use road pricing to guide motor vehicles away from the polluted Kobe route to the Wangan route by creating a gap in the tolls. Moreover, it is significant that the plaintiffs were willing to forfeit financial compensation to gain their immediate goal of a reduction in the severe air pollution.

The importance of the fact that this settlement was not a court-mediated one, but was directly agreed upon between the plaintiffs and the State (the expressway authority) cannot be stressed enough. In fact, after the court's initial ruling in favor of the plaintiffs, the State was at first unwilling to talk directly with the Amagasaki resident's group, who had approached them to propose a new agreement that would completely bypass the court system. The resident's group finally convinced them to talk, and the agreement described above was reached. The primary reason for the resident's strong desire to reach an early settlement was to ensure that concrete measures would immediately be taken to reduce the severe pollution caused by motor vehicles. If they had gone through the courts, even with the initial ruling on their side, it could have taken years for changes to take place. This case illustrates society's increasing demand for immediate and concrete solutions to the problem of air pollution.

It is equally significant that the State agreed to meet the demands of the resident's group, implementing road pricing ahead of schedule. While a part of the reason that the State decided to introduce road pricing concerns the increasingly severe air pollution levels, the primary reason, at least in this case, is that public opinion and awareness of the air pollution problem has risen. According to a survey concerning public response on the introduction of road pricing, those in opposition of road pricing have so far always exceeded those in favor. In recent years, however, as car pollution has become more severe, the voice of those in favor of road pricing has now gained a slight majority over those in opposition. In other words, those who are willing to bear an increased economic burden in order to reduce air pollution are increasing. Air pollution has become so severe as to change social consciousness.

3. Changes in Traffic Behavior Due to Road Pricing

In Japan's road transport policy, a supply-side policy that increases construction of roads has consistently been taken since the 1950's to reduce road congestion in the city. A supply-side policy is one of pursued demand, where roads are only increased after cars have increased and demand for roads has risen. Changes to this policy began in the early 1990's. In 1992, the Ministry of Construction declared that in addition to the supply of roads, a TDM (Transportation Demand Management) that restrains traffic demand from

the demand side is needed in order to reduce road congestion in the city. Since then, cities in Japan have begun experimenting with various measures of TDM, such as park & ride and car pooling.

In Japan, the aim of TDM is the improvement of flow, or reduction of car traffic. It has five targets: change of mode, time, routes, efficient use of cars, and elimination of the need to use motor transportation (Survey Research Committee for Transport Demand Management (1996)). Measures including restrictions on driving cars, and efficient logistics can achieve all of these targets, except for elimination of the need for motor transportation. The only thing standing in the way of these measures is the motivation to make them a reality. Nevertheless, TDM is a policy that aims to change traffic behavior over the long term. Unfortunately, these measures alone are often not sufficient to change people's driving behavior. Policy makers must therefore establish a number of incentives that will support the measures enlisted in TDM, as car users will rarely change their traffic behavior through appeals to their social conscience.

As a general rule, the most effective incentives to change driving behavior are economic in nature. One of the most powerful of these is road pricing, which makes car users bear an increased economic burden. Car users who are willing or able to pay the fee can do so without changing their traffic behavior, even if road pricing is introduced. However, car users who cannot or will not pay the fee are forced to change their traffic behavior, choosing other modes, traveling during pre and post restriction times, not taking restricted routes, or car pooling. Some car users will even find ways of avoiding motor transportation altogether. Thus, road pricing can have a tremendous influence on traffic behavior through its influences on income distribution. Of course, it would not be necessary to introduce road pricing if car users were willing to change their traffic behavior in order to reduce air pollution. But as most car users are not willing to do so voluntarily, levying a fee through road pricing is one measure that should be considered.

In addition to fee-based incentives, non fee-based incentives such as entrance bans on roads are also effective in changing traffic behavior. Although an entrance ban restriction does not levy a fee, it has a greater influence on traffic behavior than road pricing and is the strongest measure to reduce traffic volumes because it denies entry access to all vehicles except for buses (including private minibuses), taxis, and motorcycles. An entrance ban comes in a variety of forms, including cases of weekday traffic restrictions during peak periods, on holidays only, or during certain periods during holidays. Some restrictions deny entry semi-permanently, while others discriminate based on vehicle type.

While only a few cities have introduced road pricing, a large number have introduced entrance bans. While entrance bans have been used primarily in the past to relieve traffic congestion, they have been used more recently, and notably, for the purpose of reducing emissions and lowering levels of air pollution. That is, they are now being used not only for traffic flow management, but also as a link in the chain of environmental policies being employed by governments. For example, in certain major cities in Italy, an entrance ban that has been named "No Car Day" has been enforced since February 2000 to reduce car emissions. A similar No Car Day program has been in effect in Freiberg, Germany for

many years, with the same purpose of eliminating air pollution and of maintaining a clean living environment. In Japan, there are still no cases where entrance bans have been introduced for environmental reasons, although an entrance ban was introduced in the city of Nara in 1985 for the purpose of reducing road congestion during the peak period in the morning, to great effect. Entrance bans are also widely enforced in Japan to open roads to pedestrians during certain holiday periods.

Thus, both road pricing and entrance bans can be used to influence traffic behavior. But they exert their influence in different ways (Yoichi Obuchi, 1999). First, as explained earlier, the influence of an entrance ban on traffic behavior is greater than that of road pricing. While both limit a person's freedom to travel by car, in the case of an entrance ban, car users are obliged to change their traffic behavior because they simply are not allowed to use selected routes. On the other hand, in the case of road pricing, there is an element of choice, as anyone who can afford to, or who is willing to pay the fee can use a car. Those who cannot or will not pay are obliged to change traffic behavior. In this case, it is the level of the economic burden that influences the traffic behavior, as opposed to the physical barrier imposed by an entrance ban.

Second, while both road pricing and entrance bans result in people using public transportation as an alternative to driving, this happens to a greater extent with entrance bans compared to road pricing. In the case of the entrance ban in Nara, the majority of private car users began using the bus system. Only a few chose to adjust their commuting time by driving before the restricted period. In the case of road pricing, however, a diversion to public transportation tends to rely rather heavily not only on fee levels, but also on the degree to which car pools are enforced. The result is that fewer people will feel the need to divert to public transportation.

Third, the effect on those who do not divert to public modes is different for entrance bans compared to road pricing. In the case of an entrance ban, drivers must use non-restricted routes or periods whether they like it or not. In the case of road pricing, however, the driver has a greater choice in routes that tends to depend on the fees being levied. If the economic burden of the fee is relatively high, car users will change to no charged routes or periods.

Finally, there is a difference in the interests of local governments between entrance bans and road pricing. While local governments do not generate revenues from entrance bans, they do in the case of road pricing. This provides them with extra revenues that can be used to augment public transportation services, which further raises the possibilities of diversion to public transportation.

4. Gaining Social Consensus for Road Pricing and Policy Mix Approaches

The greatest problem in introducing road pricing is gaining social consensus. To date, the most common approach used to gain this consensus has been a package approach (Jones, P. M. 1991. Yasutugu Nitta, 1995). Here, the public is promised a specific set of outcomes (aims), such as reduced road congestion or air pollution, or improved public

transportation services, but is not informed of the measures that will be used to achieve those outcomes. While package approaches have been adopted somewhat successfully to gain social consensus, I would like to argue here that a much greater consensus can be achieved by adopting a policy mix approach. In a policy mix approach, not only are the aims of a public information campaign, such as reduced traffic congestion or improved public transportation, made known to the public, but also the measures that will be used to realize those aims.

One advantage of a policy mix approach is that there is greater flexibility in how policy makers can combine multiple aims with multiple goals for release to the public. With a package approach, policy makers are restricted to a rather one-dimensional list of aims. In a policy mix approach, however, the possible combinations of aims and goals result in a two-dimensional table that can be used to target specific public or State concerns with specific measures (Table 1).

A policy mix approach is particularly relevant today, as multiple aims and measures become more common. Unlike past years, when road pricing was used only for the aim of reducing road congestion, aims such as the reduction of air pollution, raising of funds to construct roads, and the improvement of public transport are now becoming more promi-

Table 1 Types of Policy Mix

			Combination of Measures			
			1	2	3	4
Package of Aims	A	Reduction of road Congestion	Road pricing	Road pricing Car pool	Road pricing Car pool Park & ride	Road pricing Park & ride Lowering of public transport fares
	B	Reduction of road Congestion + Air pollution	Road pricing	Road pricing Car pool	Road pricing Park & ride Car pool	Road pricing Park & ride Lowering of public transport fares
	C	Reduction of road Congestion + Air pollution + Raising funds to Construct roads	Road pricing	Road pricing Efficient logistics	Road pricing Efficient logistics Construction of circle roads	Road pricing Park & ride Construction of Circle roads
	D	Reduction of road Congestion + Air pollution + Improvement of Public transport Services	Road pricing	Road pricing Car	Road pricing Park & ride Car pool	Road pricing Park & ride Lowering of public transport fares
	E	Reduction of road Congestion + Improvement of Public transport Services + construction of pedestrian facilities	Road pricing	Road pricing Park & ride	Road pricing Park & ride Lowering of public Transport fares	Road pricing Park & ride Construction of pedestrian facilities

nent as aims that can be achieved through road pricing. Likewise, the use of multiple measures to meet these aims has also become common. Such measures include road pricing, car pooling, park & ride, the promotion of using public transport, and efficient logistics. The best way to address this potential for multiple aims vs. multiple measures is a policy mix approach. Moreover, due to the fact that a policy mix approach makes both aims and measures known to the public, it is also the best way to gain social consensus for policy decisions, particularly when those decisions involve an economic burden to the public, such as the introduction of road pricing.

To demonstrate some specific examples of the policy mix approach, I have combined a series of 5 aims, some single and some multiple, with a number of possible measures to achieve those aims (Table 1). Of course, all of these policy mix types are possible. Some, however, have already been applied in urban contexts. For example, policy mix Type 3-B (Table 1; Cell 3B) was applied to gain social consensus for the Area License Scheme in Singapore. In this case, the primary problem at hand was severe air pollution. The aims to solve this problem were to reduce road congestion and air pollution. The measures used to achieve these aims were to introduce road pricing, car pooling, and a park and ride system. One of the major factors in gaining social consensus for the Area License Scheme was the provision that cars carrying 4 or more passengers would be exempt from paying the road pricing fees. The car pooling provisions reduced the negative economic aspects of road pricing, and social consensus was gained. The park and ride system, however, was not as successful, although it might have been if there had been economic incentives such as free parking or discounts on bus fares.

The park and bus ride system introduced in Kanazawa city in 1996 is evidence that economic incentives can make for a successful park and ride program. In this case, parking fees were greatly reduced, or were eliminated altogether during the morning peak time, to great effect. Thus, the likelihood of gaining social consensus increases in policy mixes involving car pooling or park and ride systems, if there are adequate economic incentives. While this is easily done in the case of park and ride systems, it is not yet so easily done with car pooling due to the inability of current ERP technology to count the number of persons in a car.

Gaining social consensus for road pricing has also been problematic in other urban contexts. Often, the primary group in opposition to road pricing has been the trucking industry. In situations where the trucking industry will oppose road pricing, their consensus, which is essential in gaining overall social consensus, is more easily gained if provisions are made in the policy to assign a large part of the revenues, as much as 80%, to road construction. For example, in Norway, the government was faced with the need to raise funds to construct roads, reduce road congestion and reduce air pollution. To achieve these aims, a policy mix of Type 2-C (Table 1; Cell 2C) was used to gain social consensus. It included the aims of raising funds for road construction, and reducing both road congestion and traffic pollution, and included the measures of road pricing and efficient logistics. To appeal to the trucking industry, the government included in its policy a provision that it would assign a large percentage of the funds generated through road pricing to the

construction of roads. In doing so, the Norwegian government successfully gained the consensus of the trucking industry.

Currently, in Tokyo, the trucking industry is strongly opposed to the idea of introducing road pricing. For this reason, they have become the greatest obstacle to gaining overall social consensus for this policy measure. As with the example above, the successful solution to this problem will depend greatly on the type of policy mix that is designed. Moreover, in order to promote efficient logistics, it will be necessary to install economic incentives into the policy, such as toll reductions for trucks that are being used for business or joint transport.

The case of gaining social consensus for road pricing in tourist areas presents yet another challenge to policy makers. For example, in a tourist city such Kamakura, road pricing is likely to be opposed by visitors to the area, which in turn has made local shop owners hostile toward the introduction of road pricing. They are worried that road pricing will reduce the number of tourists to the area, which will hurt them economically. In fact, though road pricing has not yet been introduced in Kamakura, the number of tourists has already been decreasing due to the influence of the economic recession, and store profits have decreased accordingly. Shop owners are concerned that their profits will likely continue to decrease if road pricing is introduced, and have required the local government to reexamine their plan to introduce the system in Kamakura. In fact, the shop owners have grounds to be concerned. According to a survey conducted in 1996 (Kamakura Area Traffic Plan Research Committee, 1997), about one fourth of tourists using a car responded that they would cease to visit Kamakura if road pricing were introduced.

Thus, the primary party concerned in gaining social consensus in this particular case is the tourists. If the policy mix appeals to the tourists, they will continue to come to Kamakura, which will, in turn, help to win the consent of shop owners. In order to gain this social consensus, the aims of the policy mix should be a reduction of road congestion, improvement of public transport and construction of pedestrian facilities. The measures to achieve those aims should be road pricing and a park & ride system (Type 2-E, Cell 2E). The local government must also be sure to include a strong economic incentive for tourists to use the park and ride system (Francis J. L. and Ingrey M. J., 2000). This is best done by using revenues from road pricing to reduce or even eliminate parking fees, and lower fares for public transport systems such as the Enoshima Electric Railway and buses. In fact, the 1996 survey revealed that 60% of respondents would support road pricing if revenues collected were used for the improvement of public transport services and the construction of pedestrian facilities. It will therefore be relatively easy to gain consensus for introducing road pricing with this particular policy mix.

Of all the factors involved in gaining social consensus for road pricing in a policy mix approach, one of the most important is the degree to which local governments make it clear how they will use funds raised through road pricing. If a city wishes to attack the problem of air pollution, they may suggest a policy mix of Type 4-D (Table 1; Cell 4D), which has aims consisting of reduction of road congestion and air pollution, and the improvement of public transport service, and measures consisting of road pricing, a park and

ride system, and lowering of public transport fares. In order to increase the likelihood of gaining social consensus for this policy, the local government must make it adequately clear how the funds generated from road pricing will be used. This disclosure of revenue use is particularly powerful in gaining consensus when the funds generated are to be used for economic incentives such as reducing parking fees in park and ride systems, or lowering public transport fares. A good example of this is Norway, where a public campaign explaining that revenues would be used to improve public transport services played a major role in gaining social consensus for road pricing.

5. Possibilities of Gaining Social Consensus for Road Pricing in Tokyo

The possibility of gaining social consensus for road pricing in Tokyo will depend greatly on the type of policy mix proposed. This possibility is, however, extremely difficult to predict with any accuracy at this stage, as the level of fees to be charged, the areas to be restricted, and the times and types of vehicles that will be restricted have yet to be announced. There are, however, a number of factors that increase the likelihood of gaining this social consensus.

First, social consciousness for introducing road pricing has changed in Tokyo as air pollution has become more severe. As a result, those in favor of road pricing are increasing; its supporters, in fact, now outnumber those opposed by a slight majority. This means that there are an increasing number of people who want to improve their living environment, even if it means an increased economic burden. A raised social consciousness was a primary factor in the settlement reached in the air pollution suit in Amagasaki. This is further evidence that social consciousness has raised, and psychological resistance against road pricing has weakened.

Second, the laws that currently prevent local governments from implementing road pricing went under review as of last summer. If these laws are passed, they will eliminate an important barrier that cities like Kamakura have been facing in trying to deal with their own traffic concerns. While the laws have not yet been changed in the National Diet, it is anticipated that when they are, local governments will take this as a signal to begin taking road pricing into consideration.

Finally, the current government in Tokyo can be expected to play an important role in the introduction of road pricing. When road pricing was successfully introduced in Singapore in 1975, many believed that it was a result of the strong leadership of Premier Lee Kwan Yu. Similarly, Tokyo's Metropolitan Governor, Shintaro Ishihara, has displayed strong leadership since his election. This leadership may make a difference in the government's ability to gain social consensus.

There is, however, one major obstacle in the way of gaining social consensus for road pricing in Tokyo. At the moment, the trucking industry is adamantly opposed to the introduction of user fees for roads. This opposition is compounded by the fact that the trucking industry has recently been told that a very expensive air filter device must be installed on all diesel vehicles by October 2003 if they wish to use roads in the Tokyo

Metropolitan area. Being asked to carry the cost of both the diesel filter and road pricing fees in such a short time is making it extremely difficult to gain consensus of the trucking industry.

Thus, one of the greatest factors in gaining social consensus on road pricing will be the ability of policy makers to gain the consent of the trucking industry. This most important task will be best accomplished through the adoption of a policy mix approach. The policy mix to gain social consensus for road pricing in Tokyo should be a combination of aims consisting of the reduction of road congestion and air pollution, the raising of funds to construct roads, and the improvement of public transport services. The measures used to achieve these aims should be road pricing, efficient logistics and the lowering of public transport fares. Moreover, this policy mix should specify how revenues raised from road pricing are to be used. Finally, if the policy mix is expected to gain social consensus, then policy makers should make it clear to the public that revenues will be used to construct roads, to improve public transport services and lower fares, and to reduce tolls for trucks used for business or joint transport.

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